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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/712,552

11/13/2003

Klaus Hrastrnik

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9167

26646

7590

12/30/2004

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EXAMINER

PERRY, ANTHONY T

ART UNIT

PAPER NUMBER

2879

DATE MAILED: 12/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/712,552

Applicant(s)

HRASTNIK, KLAUS

Examiner

Anthony T Perry

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R✓

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 11/13/03
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-2 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Ryan (US 4,771,209).

Regarding claims 1 and 2, Ryan teaches a spark plug including an electrode segment that includes an alloy of platinum and copper (see col. 4, line 59 – col. 5, line 15).

Regarding claims 1 and 4, Ryan teaches a spark plug including an electrode segment that includes an alloy of iridium and copper (see col. 4, line 59 – col. 5, line 15).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 7-15 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Shibata et al. (US 6,720,716).

Regarding claim 7-8, Shibata et al. state that “a preferable material for the center electrode tip and the ground electrode tip is a Pt alloy containing at least one additive selected from the group consisting of Ir (50 weight % or less), Ni (40 weight % or less), Rh (50 weight % or less), W (30 weight % or less), Pd (40 weight % or less), Ru (30 weight % or less), and Os (20 weight % or less)” (see col. 8, lines 5-15). In accordance with the above teachings, Shibata et al. disclose an electrode with an electrode segment made up of platinum in a proportion of 75 mass percent and rhodium in a proportion of 25 mass percent.

Regarding claims 9-10, Shibata et al. disclose an electrode with an electrode segment made up of platinum in a proportion of 50 mass percent, rhodium in a proportion of 25 mass percent, and iridium in a proportion of 25 mass percent (see col. 8, lines 5-15).

Regarding claim 11, Shibata et al. disclose an electrode with an electrode segment made up of platinum in a proportion of 50 mass percent, rhodium in a proportion of 25 mass percent, and nickel in a proportion of 25 mass percent (see col. 8, lines 5-15).

Regarding claim 12, Shibata et al. teach that the electrode segment have up to one mass percent of osmium (see col. 8, lines 5-15).

Regarding claim 13, Shibata et al. teach the spark plug (100) including a first electrode (30) and a second electrode (40), and wherein a spark oversparks between the first electrode (30) and the second electrode (40) along a spark gap in response to application of a voltage, the spark gap leading to the electrode segment (50) of the electrode (see Fig. 1).

Regarding claim 14, Shibata et al. teach the electrode including an electrode base body composed of nickel with a copper core (see col. 9, lines 45-50). The electrode segment is fixed to the electrode base body via laser welding (col. 10, lines 10-12).

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Regarding claim 15, Shibata et al. disclose a spark plug wherein the electrode is a middle electrode (30). The spark plug comprises at least one ground electrode (40), an insulator (20), and a housing (10), wherein the middle electrode (30) is regionally insulated from the housing (10) by the insulator (20), and wherein the ground electrode (40) is affixed to the housing (10) (see Fig. 1).

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ryan (US 4,771,209).

Regarding claim 3, Ryan discloses the claimed invention except for the limitation of the platinum being in the range of 60-99 mass percent and the copper being in the range of 1-40 mass percent. However, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an amount of platinum and copper so that the electrode chips have a desirable ductility without compromising the oxidation and erosion resistant characteristic of the chip, since optimization of workable ranges is considered within the skill of the art.

Claims 1 and 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang et al. (US 6,045,424) in view of Ryan (US 4,771,209).

Regarding claims 1 and 5, Chang et al. teach an electrode having an electrode segment including platinum in a proportion of 80 mass percent and rhodium in a proportion of 20 mass percent. Chang et al. do not specifically teach the electrode segment containing copper.

However, Ryan teaches that refractory metal such as platinum and rhodium are brittle after sintering. Ryan teaches that the ductility can be increased by including copper to the refractory metals (see col. 5, lines 1-15). Accordingly, it would have been obvious at the time the invention was made to a person having ordinary skills in the art to add copper to the Pt-Rh alloy taught by Chang et al. so as to increase the malleability of the electrode segment easing the process of forming the segment into a desired shape and size. Since discovering optimum or workable ranges involves only routine skill in the art, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an amount of platinum, rhodium, and copper so that the electrode chips have a desirable ductility without compromising the oxidation and erosion resistant characteristic of the chip, since optimization of workable ranges is considered within the skill of the art.

Regarding claims 1 and 6, Chang et al. teach an electrode having an electrode segment including platinum in a proportion of 80 mass percent and iridium in a proportion of 20 mass percent. Chang et al. do not specifically teach the electrode segment containing copper.

However, Ryan teaches that refractory metal such as platinum and iridium are brittle after sintering. Ryan teaches that the ductility can be increased by including copper to the refractory metals. Accordingly, it would have been obvious at the time the invention was made to a person having ordinary skills in the art to add copper to the Pt-Ir alloy taught by Chang et al. so as to increase the malleability of the electrode segment easing the process of forming the segment into a desired shape and size. Since discovering the optimum or workable ranges involves only routine skill in the art, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an amount of platinum, iridium, and copper so that the

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electrode chips have a desirable ductility without compromising the oxidation and erosion resistant characteristic of the chip, since optimization of workable ranges is considered within the skill of the art.

### ***Other Prior Art Cited***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Lykowski et al. (US 6,412,465) and Matsutani et al. (US 6,664,719) teach yttrium oxide being added in small amounts to more effectively restrain oxidation volatilization of electrode chips at high temperature.

Kagawa et al. (US 4,670,684) teach a chip made of Pt-20Rh-10Ni (col. 3, lines 7-10).

Hopps (US 2,239,561) teach an electrode segment (end portion) made of Pt-30Rh-10Ir (claim 3).

Kagawa (JP 02242577 A) teaches Pt-30Cu.

Matsutani (JP 11040314 A) teaches Ir-8Cu.

### **Contact Information**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to *Anthony Perry* whose telephone number is **(571) 272-2459**. The examiner can normally be reached between the hours of 9:00AM to 5:30PM Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel, can be reached on (571) 272-24597. **The fax phone number for this Group is (703) 872-9306.**

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Communications via Internet e-mail regarding this application, other than those under 35 U.S.C. 132 or which otherwise require a signature, may be used by the applicant and should be addressed to [Anthony.perry@uspto.gov].

*All Internet e-mail communications will be made of record in the application file. PTO employees do not engage in Internet communications where there exists a possibility that sensitive information could be identified or exchanged unless the record includes a properly signed express waiver of the confidentiality requirements of 35 U.S.C. 122. This is more clearly set forth in the Interim Internet Usage Policy published in the Official Gazette of the Patent and Trademark on February 25, 1997 at 1195 OG 89.*

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.



Anthony Perry  
Patent Examiner  
Art Unit 2879  
December 22, 2004



Vip Patel  
Primary Examiner  
Art Unit 2879